

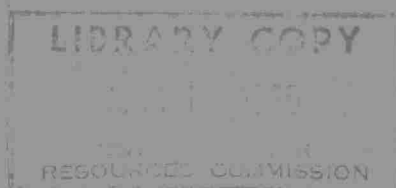
THE
ONTARIO WATER RESOURCES
COMMISSION

WATER POLLUTION SURVEY

OF THE

TOWNSHIP OF WALLACE

1964



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ONTARIO WATER RESOURCES COMMISSION

REPORT ON

WATER POLLUTION SURVEY

TOWNSHIP OF WALLACE

BY

DIVISION OF SANITARY ENGINEERING

MARCH, APRIL & JULY
1964.

INTRODUCTION

This report is the result of a survey to ascertain whether conditions exist which may cause pollution of the watercourses located in the Township of Wallace. Preliminary interviews were held with municipal officials in March and April, 1964, and the sampling programme was carried out in July, 1964, which is a critical period for stream pollution.

The Ontario Water Resources Commission conducts such surveys routinely and upon request throughout the province as part of its objective to eliminate existing and potential sources of stream pollution.

When adverse conditions are found to exist, recommendations are made to assist the township in the initiation and development of a pollution abatement programme.

GENERAL

The Township of Wallace, with a resident population of 2,087 is situated in the northern part of the County of Perth. It has a taxable assessment of 3,252,000 dollars. The economy of the township relies, for the most part, on mixed and dairy farming. There are no major industrial or subdivision developments at the present time.

The hamlets of Kurtzville and Gowanston are the only centres of residential development in the township.

The Township of Wallace is drained by the upper reaches of the Middle Maitland and Little Maitland rivers. These rivers

are part of the Maitland River Watershed which drains into Lake Huron at the Town of Goderich.

WATER USES

There is no municipally operated water system in the township. Water supplies are obtained from private wells. Information obtained indicated that the wells are generally adequate for domestic and farm purposes.

A private water system is operated in the hamlet of Kurtzville and it serves 20 to 25 residents.

Recreational and Agricultural Uses

The streams in the township are generally not used for recreational purposes.

The streams are used extensively for a source of drinking water for cattle.

WATER POLLUTION

1. Sanitary Waste Disposal

Sanitary wastes are, in general, treated in septic tank systems or other individual disposal units. There is no inspection programme provided by the township to control the installation of sanitary waste treatment systems. Information obtained during the survey indicated that the present systems are functioning satisfactorily.

There are no areas in the township of sufficient population density to warrant a municipal sewage works at the present time.

2. Refuse Disposal

A township operated refuse disposal site is located in the north part of Lot 39, Concession 7, Township of Wallace. It consists of an abandoned gravel pit where the refuse is periodically burned and then buried.

3. Industrial Waste Disposal

Marion Beaver Cheese and Butter Co-operative

This plant produces cheese, whey butter and buttermilk. The plant draws an estimated 1,000 gallons per day of water from a private deep well for cooling and wash-up water. The wash-up water is high in BOD and suspended solids. This waste water is discharged to the land by means of a spray irrigation system during the warm weather months and is discharged to a tributary of the Little Maitland River during the cold weather months.

Wallace Cheese and Butter Company

This plant produces cheese and whey butter. The plant draws an estimated 1,500 gallons per day of water from a deep well for cooling and wash-up water. The wash-up water, which is high in BOD and suspended solids, is drawn away by means of a tank truck during the warm weather months and is sprayed on nearby pasture lands. During the cold weather months, all the waste water is discharged directly to the Middle Maitland River.

A 300-bed Ontario Hospital is under construction on the west side of Highway No. 23 approximately two miles south of Palmerston. The sanitary waste water will be discharged to a

10-acre stabilization pond. The effluent from the pond will be discharged to a chlorine contact chamber and then to the Little Maitland River.

4. Discussion of Sample Analyses

Samples were collected from nine locations in the township to ascertain the extent of pollution in the streams as they flow through the township.

An explanation of the significance of the sample analyses is contained in the appendix, and the location of the sampling points is indicated on the map appended to this report. The results of the samples are appended to the report.

At sample point MML-73.2 the sanitary chemical quality of the water was satisfactory, but the bacterial quality was above the objective of a maximum of 2,400 coliforms per 100 ml. As no sanitary wastes are known to discharge upstream from this point, the high coliform count could be due to the run-off from the fields and the low flow at the time of the sampling.

At sampling point MMLW-81.0, both the chemical and bacterial quality was above the objectives of 4 ppm BOD and 2,400 organisms per 100 ml which are recommended by the Commission. This condition could exist due to the effluent from the Town of Palmerston sewage works, which is located in the Township of Minto, approximately two miles upstream from the sampling point location.

At sampling point MML-85.1, the chemical quality was

satisfactory, but the bacterial quality was above the objective of 2,400 organisms per 100 ml recommended by the Commission. This could be caused by contaminated waste water being discharged to the stream by the Marion Beaver Cheese Co-operative.

At sampling point MM-94.9, the chemical quality was above the maximum limit of 4 ppm of BOD recommended by the Commission. This could be caused by the discharging of untreated milk wastes to the stream by the Wallace Cheese Plant.

The sewage works at Palmerston and the two cheese plants are routinely inspected by the Commission in order to establish adequate treatment programmes for the sanitary and industrial waste waters. Copies of the reports indicating the steps being taken to control pollution by the above are made available to the municipality.

The results of the samples indicated that there was no major pollution of the streams in the township at the time of the survey.

SUMMARY

1. A water pollution survey was carried out to determine the sources of pollution in the Township of Wallace.
2. The two cheese plants are the only known sources of pollution located in the township, and they are both exercising limited pollution abatement programmes.

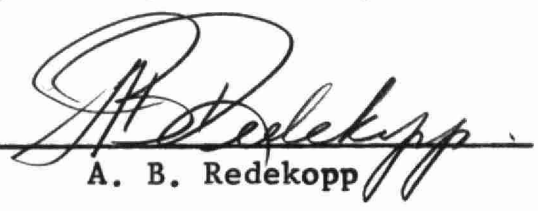
3. The extent of pollution in the Wallace drain is contingent on the degree of treatment provided at the Town of Palmerston sewage works.
4. The township does not exercise control of individual disposal systems.
5. The survey indicated that a major pollution problem did not exist in the township at the time of the survey.

RECOMMENDATION

It is recommended that the township inspect all private sewage disposal systems as they are installed to prevent the contamination of both ground water and surface water.

All of which is respectfully submitted,

District Engineer:


A. B. Redekopp

Approved by:


K. H. Sharpe, Director

Prepared by:

R. G. Quance, C.S.I.(c)

/mh

SAMPLE ANALYSES

DATE 1964	SAMPLING PT. NO.	SAMPLING POINT DESCRIPTION	5-DAY BOD PPM.	SOLIDS (PPM)			TURBIDITY IN SILICA UNITS	COLIFORM PER 100 ML.
				TOTAL	SUSP.	DISS.		
JULY 30	MMW-73.2	LITTLE MAITLAND RIVER TRIBUTARY AT HIGHWAY 86, LOT 42, CONC. 1	1.8	372	-	-	4.0	28,000
JULY 30	MMW-73.8	LITTLE MAITLAND RIVER AT CONC. 3, LOT 41	0.9	264	-	-	2.0	650
JULY 30	MMW-68.8	LITTLE MAITLAND RIVER AT WALLACE-HOWICK TOWN LINE CONC. 4, LOT 58	1.0	236	-	-	2.3	350
JULY 30	MMW-76.2	LITTLE MAITLAND RIVER AT CONC. 5, LOT 36	1.7	338	-	-	3.5	140
JULY 30	MMW-85.1	LITTLE MAITLAND RIVER TRIBUTARY AT CONC. 8, LOT 6.	2.1	322	-	-	6.5	780
JULY 30	MMW-81.0	DITCH AT HIGHWAY 23, LOT 24 CONC. 8 (WALLACE DRAIN)	7.1	444	9	435	-	16,000
JULY 30	MMW-85.1	LITTLE MAITLAND RIVER TRIBUTARY LOT 19, CONC. 8	1.9	302	-	-	5.5	32,000
JULY 30	MM-84.9	MIDDLE MAITLAND RIVER AT CONC. ROAD 2 - 3, LOT 16.	10.2	472	-	-	16.0	200
JULY 30	MM-82.8	MIDDLE MAITLAND RIVER AT LOT 22, CONC. 1, NORTH-EAST OF LISTOWEL	2.1	300	-	-	2.6	170

NOTE: ALL ANALYSES REPORTED IN PPM, UNLESS OTHERWISE INDICATED.

APPENDIX

EXPLANATION & SIGNIFICANCE OF LABORATORY ANALYSES

ALL THE LABORATORY TESTS INCLUDED IN THIS REPORT WERE PERFORMED AT THE ONTARIO WATER RESOURCES COMMISSION LABORATORY IN TORONTO.

A. BACTERIOLOGICAL EXAMINATION

THE MEMBRANE FILTER TECHNIQUE IS USED TO OBTAIN A DIRECT ENUMERATION OF COLIFORM ORGANISMS. THESE ORGANISMS ARE NORMAL INHABITANTS OF THE INTESTINES OF MAN AND OTHER WARM-BLOODED ANIMALS. THEY ARE ALWAYS PRESENT IN LARGE NUMBERS IN SEWAGE AND ARE GENERALLY MINIMAL IN OTHER WATER POLLUTANTS.

THE RESULTS OF THE EXAMINATIONS ARE REPORTED AS "MF COLIFORM COUNT PER 100 ML".

THE COMMISSION'S OBJECTIVE FOR STREAM SANITATION IS A COLIFORM DENSITY OF NOT GREATER THAN 2,400 ORGANISMS PER 100 ML.

B. SANITARY CHEMICAL ANALYSES

BIOCHEMICAL OXYGEN DEMAND (BOD):

BIOCHEMICAL OXYGEN DEMAND IS REPORTED IN PARTS PER MILLION (PPM), AND IS AN INDICATION OF THE AMOUNT OF OXYGEN REQUIRED FOR THE STABILIZATION OF DECOMPOSABLE ORGANIC MATTER IN THE WATER. THE COMPLETION OF THE LABORATORY TEST REQUIRES FIVE DAYS, UNDER THE CONTROLLED INCUBATION TEMPERATURE OF 20°C.

THE COMMISSION OBJECTIVE FOR STREAM WATER QUALITY IS AN UPPER LIMIT OF 4 PPM.

SOLIDS:

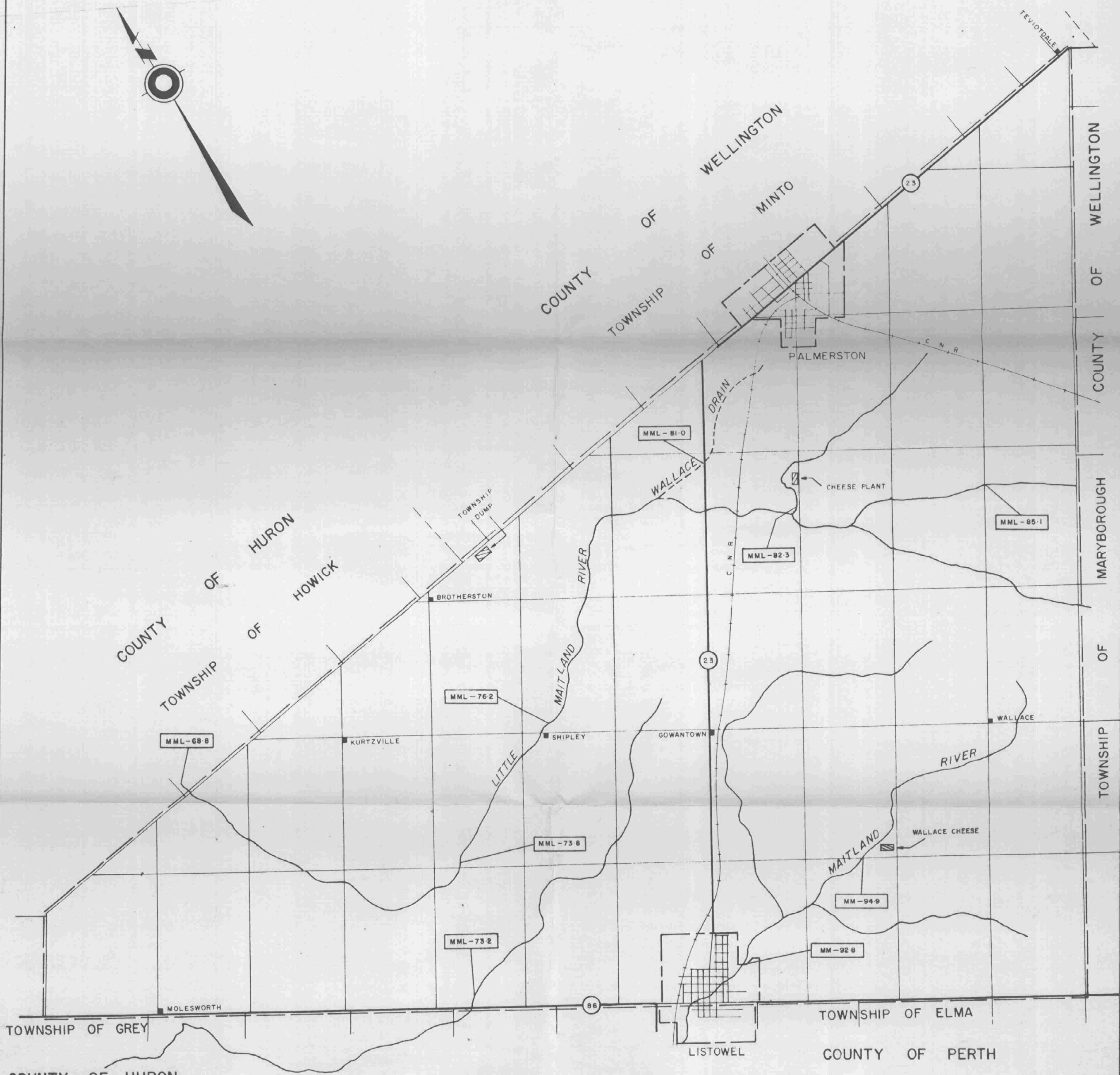
THE VALUE FOR TOTAL SOLIDS, EXPRESSED IN PARTS PER MILLION (PPM), IS THE SUM OF THE VALUES FOR THE SUSPENDED AND THE DISSOLVED MATTER IN THE WATER. THE CONCENTRATION OF SUSPENDED SOLIDS IS GENERALLY THE MOST SIGNIFICANT OF THE SOLIDS ANALYSES IN REGARD TO STREAM WATER QUALITY.

THE EFFECTS OF SUSPENDED SOLIDS IN WATER ARE REFLECTED IN DIFFICULTIES ASSOCIATED WITH WATER PURIFICATION, DEPOSITIONS IN STREAMS, AND INJURY TO THE HABITAT OF FISH.

WHERE SUSPENDED SOLIDS VALUES ARE LESS THAN 20 PPM LABORATORY DIFFICULTIES ARE EXPERIENCED AND THE TURBIDITY IS DETERMINED INSTEAD.

TURBIDITY:

TURBIDITY IS CAUSED BY THE PRESENCE OF SUSPENDED MATTER, SUCH AS CLAY, SILT, FINELY DIVIDED ORGANIC MATTER, PLANKTON AND OTHER MICROSCOPIC ORGANISMS IN WATER. IT IS AN EXPRESSION OF THE OPTICAL PROPERTY OF A SAMPLE AND RESULTS ARE REPORTED IN "TURBIDITY UNITS".



LEGEND

MM-92-8 - SAMPLING POINT SHOWING STREAM AND MILEAGE

ONTARIO WATER RESOURCES COMMISSION	
TOWNSHIP OF WALLACE	
COUNTY OF PERTH	
WATER POLLUTION SURVEY	
SCALE	
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